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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 09/781,327 | 02/13/2001 | Hironao Hakogi | 1614.1124 | 9065 |

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EXAMINER

PAK, SUNG H

ART UNIT PAPER NUMBER

2874

DATE MAILED: 07/27/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/781,327

Applicant(s)

HAKOGI ET AL.

Examiner

Sung H. Pak

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Am

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 5/13/2004, 4/13/2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-9 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-9 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 13 February 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 0504.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 4/13/2004 has been entered.

Information Disclosure Statement

The information disclosure statement filed 5/13/2004 has been considered by the examiner. Please refer to the initialed copy of PTO-1449.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

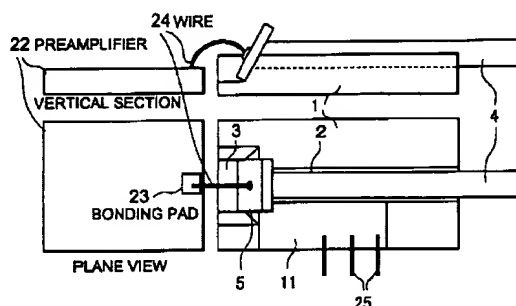
(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later

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invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 8-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tachigori (US 6,042,276).



Tachigori discloses an optical module comprising: an optical fiber ('4', Fig. 10-reproduced above) having a slope end surface; a photodetector ('5') mounted on the slope end surface, and optically coupled directly with the optical fiber, the slope end surface being inclined with respect to an optical axis in the fiber (Fig. 10 above); wherein the end surface of the photodetector is inclined with respect to the optical axis in the fiber (Fig. 10 above); and the photodetector having electrodes on a rear surface thereof opposite to a front surface thereof attached to the slope end surface ('24' Fig. 10 above).

However, Tachigori does not explicitly teach the use of a ferrule, such that the optical fiber end is held in a ferrule. Nevertheless, the use of a fiber ferrule on optical fiber ends is well known and common in the art. The use of a fiber ferrule is well known to be advantageous and desirable because ferrules provide mechanical support for fragile fiber ends, such that physical coupling between the fiber ends and optical devices (such as a photodetector) does not cause

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physical damage to fiber ends. Thus, the use of ferrules prevents optical coupling loss by preventing physical damage to fiber ends.

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify the Tachigori device to have a ferrule on the fiber end.

Claims 1-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tachigori (US 6,042,276) in view of Mesaki et al (US 6,217,231 B1).

Mesaki et al was cited in the previous office actions.

Tachigori discloses an optical module as discussed above.

In addition, Tachigori discloses: a module substrate supporting the fiber ('1' Fig. 10); electronic parts mounted on the module substrate ('11', '25'); the photodetector being adhered to the slope end surface (Fig. 10 above).

However, Tachigori does not explicitly teach: that the photodetector has a size smaller than the area of the slope end surface (as claimed in claims 1 and 6 of the instant application); a resin package covering a portion of the fiber (as claimed in claim 1); a supporting base mounted on the module substrate (as claimed in claim 2); wherein the resin package has engagement protrusion which are to be engaged with an optical connector, and the engagement protrusion extend along side surfaces of the resin package (as claimed in claims 4 and 5).

Mesaki, on the other hand, explicitly teaches an optical module package comprising: a photodetector smaller than the area of the end surface (Fig. 22B); a resin package covering the portion of the fiber (Fig. 21, column 13 lines 15-16); a supporting base mounted on the module

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substrate, supporting the fiber (Fig. 22A-22B); engagement protrusions extending along side surfaces of the resin package for coupling with optical connector (Fig. 22A- 22B).

Regarding claims 1,6, it is considered advantageous and desirable in the art to use photodetector smaller in size than the area of the slope end face because the smaller photodetector allows easier alignment between the light transmitting waveguide core and the light receiving window of the photodetector device. Better optical alignment advantageously reduces optical coupling loss.

Regarding claim 1, the use of a resin package for covering a photodetector and a portion of the optical fiber as shown in Fig. 22A-22B of Mesaki, is advantageous and desirable because a resin package provides cost effective means for protecting fragile optical fiber and photodetector device from harsh environmental factors.

Regarding claims 2, 4, and 5, the use of supporting base and engagement protrusions is advantageous and desirable over the prior art because they provide simple and effective means for ensuring optimal optical alignment among device components. The supporting base and engagement protrusions advantageously ensure optical alignment among the photodetector, the optical fiber, the an optical connector, such that undesirable coupling loss is minimized.

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify the Tachigori device to have the photodetector smaller than the area of the slope end surface; a resin package covering a portion of the; a supporting base mounted on the module substrate; and engagement protrusions extending along side surfaces of the resin package.

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Response to Arguments

In response to the newly amended limitations, a new ground of rejection is provided in this office action.

Applicants' arguments presented in Remarks have been carefully studied by the examiner, however they are considered moot in view of the new ground of rejection.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Roff et al (US 5,434,940) discloses an photodetector coupled with a fiber ferrule, herein the photodetector has a size smaller than the end face of the fiber ferrule (Fig. 1, Fig. 2B).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sung H. Pak whose telephone number is (571) 272-2353. The examiner can normally be reached on Monday- Friday, 9AM-5PM.

The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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A handwritten signature in black ink, appearing to read 'Sung H. Pak', with a stylized, flowing script.

Sung H. Pak
Examiner
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